

WHAT IS CLAIMED IS:

1 1. An ink jet recording apparatus, comprising:
2 a recording head including a nozzle orifice communicated with a
3 pressure generating chamber;
4 a pressure generator, which varies pressure of ink in the pressure
5 generating chamber; and
6 a controller, which drives the pressure generator to eject ink droplets
7 from the nozzle orifice such that a plurality of flushing operations are
8 intermittently repeated with a first time interval, when a recording operation of
9 the recording head is not performed, each flushing operation including a
10 plurality of ink ejections repeated for a predetermined times with a second time
11 interval which is shorter than the first time interval.

1 2. The ink jet recording apparatus as set forth in claim 1, wherein an
2 ejection frequency in a final flushing operation is higher than an ejection
3 frequency in an initial flushing operation.

1 ¹³ 3. The flushing control method as set forth in claim ¹⁴ 2, wherein an
2 ejection frequency in a latter flushing operation is higher than an ejection
3 frequency in a former flushing operation.

1 4. The flushing control method as set forth in claim 1, wherein the
2 repeated number of ink ejection in a final flushing operation is greater than the
3 repeated number of ink ejection in an initial flushing operation.

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1 ¹⁹ 5. The flushing control method as set forth in claim ¹⁸ 4, wherein the
2 repeated number of ink ejection in a latter flushing operation is greater than the
3 repeated number of ink ejection in a former flushing operation.

1 ² 6. The ink jet recording apparatus as set forth in claim 1, wherein the
2 controller drives the pressure generator to vibrate a meniscus of ink in the
3 nozzle orifice between the respective flushing operations.

1 ³ 7. The ink jet recording apparatus as set forth in claim ² 6, wherein the
2 meniscus of ink is vibrated such an extent that an ink droplet is not ejected
3 from the nozzle orifice.

1 ⁴ 8. The ink jet recording apparatus as set forth in claim ² 6, wherein the
2 pressure generator is driven at the maximum driving frequency thereof to
3 vibrate the meniscus of ink.

1 9. The ink jet recording apparatus as set forth in claim 1, the controller
2 drives the pressure generator to vibrate a meniscus of ink in the nozzle orifice
3 before an initial flushing operation is performed.

1 10. The ink jet recording apparatus as set forth in claim 1, wherein:
2 the recording head performs the recording operation while moving in
3 a main scanning direction; and
4 the flushing operations are performed when the recording head is in a

5 stand-by state which is defined as a time period from when the recording head
6 stops moving to when the recording head starts moving.

1 11. The ink jet recording apparatus as set forth in claim 10, further
2 comprising a timer, which measures a time period of the stand-by state,
3 wherein the repeated number of ink ejections in the respective
4 flushing operation is determined in accordance with the measured stand-by
5 time period.

1 12. The ink jet recording apparatus as set forth in claim 10, further
2 comprising a timer, which measures a time period of the stand-by state,
3 wherein:

4 the controller drives the pressure generator to vibrate a meniscus of
5 ink in the nozzle orifice; and

6 a vibrating number is determined in accordance with the measured
7 length of the stand-by time period.

1 13. The ink jet recording apparatus as set forth in claim 1, wherein the
2 repeated number of ink ejection in the respective flushing operations is
3 determined in accordance with the type of ejected ink.

1 ~~14.~~ ⁵ The ink jet recording apparatus as set forth in claim ~~8~~ ², wherein a
2 vibrating number of the pressure generator is determined in accordance with
3 the type of ejected ink.

1 ⁷ 15. The ink jet recording apparatus as set forth in claim ⁶ 8, wherein a
2 vibrating number of the pressure generator is determined in accordance with
3 the type of ejected ink.

1 ¹¹ 16. The ink jet recording apparatus as set forth in claim 1, wherein the
2 pressure generator is a piezoelectric vibrator which changes the volume of the
3 pressure generating chamber to vary the pressure of ink therein.

1 17. The ink jet recording apparatus as set forth in claim 1, the controller
2 includes:
3 a drive signal generator, which generates a common drive signal
4 including a flushing waveform configured to perform an ink ejection and a
5 meniscus vibrating waveform configured to vibrate a meniscus of ink in the
6 nozzle orifice; and
7 a drive waveform selector, which applies the flushing waveform and
8 the meniscus vibrating waveform selectively to the pressure generator.